

Application No. 09/928,619

REMARKS

The Office Action of October 14, 2003 has been carefully considered. Reconsideration of this application, as amended, is respectfully requested. Claims 1-22 and 25-29 are pending in this application. Of these, claims 1, 11, 22, and 28 are independent claims. This Amendment amends the specification to correct a typographical error.

In addition, this Amendment amends claims 1, 5-7, 20-22 and 25; adds new claims 27, 28, and 29; and cancels claims 14, 23 and 24. Independent claims 1 and corresponding apparatus claim 22 were amended to incorporate the limitations in claim 5, and claim 5 was amended to incorporate one limitation of claim 4. New apparatus claim 27 incorporates limitations of corresponding method claim 3. Claim 11 was amended to incorporate the limitations of claim 14, and claim 14 was canceled. New independent apparatus claim 28 incorporates limitations of corresponding independent method claim 11. Claim 19 was amended to incorporate additional details concerning learning. New apparatus claim 29 incorporates the limitations of corresponding method claim 19. Support for these amendments is found in Applicant's specification in Figure 1 and 4 and accompanying disclosure in the specification on page 8, lines 16-32, in section 4 starting on page 34, and at page 31, lines 9-31.

1. Response to Rejection Under 35 USC 112

The Office Action in section 3, starting on Page 2, rejects claims 6, 20, and 21 under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In response thereto, Claim 6 was amended to no longer depend on itself; Claim 20 was amended to conform to the language of the specification; and Claim 21 was amended to specify that the granule features are aggregated as a weighted function. Accordingly, Applicant the rejections under 35 USC 112, second paragraph, of claims 6, 20, and 21 are now believed to be overcome.

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2. Response to Rejection Under 35 USC 102

The Office Action in section 5, starting on page 3, rejects claims 1-26 under 35 USC 102(e) as being anticipated by Shetty et al., US 2003/0046253 A1 (hereinafter referred to as "Shetty"). In response thereto Applicant amends independent claims 1, 11 (and corresponding new independent claim 28) and 22 to more clearly set forth and claim what is believed to be Applicant's invention.

Applicant's invention concerns a text categorizer that is adapted to classify a text object into one or more classes. The text categorizer includes a pre-processing module, a knowledge base, and an approximate reasoning module. The pre-processing module performs feature extraction, feature reduction, and fuzzy set generation to represent an unlabelled text object in terms of one or more fuzzy sets. The approximate reasoning module uses a measured degree of match between the one or more fuzzy set and categories represented by fuzzy rules in the knowledge base to assign labels of those categories that satisfy a selected decision making rule.

2.1 Shetty Fails To Disclose or Suggest transforming a probability distribution into a document fuzzy set as recited in claims 1 and 22

In accordance with one aspect of the invention recited in independent claims 1 and 22, fuzzy set generation involves constructing a document class fuzzy set by transforming the probability of occurrence of each feature in a set of features extracted from a text object.

In contrast, Shetty discloses neuro/fuzzy hybrid approach to clustering data. In particular, Shetty discloses a technique for clustering data in which: samples of a predetermined window length are received. The sample data is checked for uncertainty and/or robustness. The data is then clustered based on the outcome of the checking. (see paragraphs [0009] – [0011] of Shetty). Shetty discloses that the data may be clustered using either a fuzzy logic approach (see paragraphs [0048] through [0078]) or an unsupervised learning approach (see paragraphs [0079] – [0097]).

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Shetty further discloses that when a fuzzy logic approach is used, data is clustered "by forming a compatibility relationship matrix including the read data using a distance function such that the value obtained using the distance function is between 0 and 1" (see paragraph [0102]). That is, while the fuzzy logic approach disclosed by Shetty is based on distance function, Applicant's claimed invention set forth in independent claims 1 and 22 involves the transformation of a probability distribution into a document class fuzzy set.

More specifically, Shetty fails to disclose or suggest as claimed by Applicant in independent claims 1 and 22 the act transforming a probability distribution into a document fuzzy set by: calculating a frequency of occurrence for each feature in the set of features in the text object; normalizing the frequency of occurrence of each feature in the set of features; and transforming the normalized frequency of occurrence of each feature in the set of features to define the document class fuzzy set.

2.2 Shetty Fails to Disclose or Suggest representing each term in a document as a granule feature fuzzy set recited in claims 11 and 28

In accordance with another aspect of the invention recited in independents claim 11 and 28, there is provided a method for classifying a text object by computing a degree of match between each of a plurality of class *granule* feature fuzzy sets and the document *granule* feature fuzzy set to provide a degree of match for each ones of the granule features of the text object, and then aggregating each degree of match of the ones of the granule features to define an overall degree of mach for each feature.

The "granularity of clustering" referred to by Shetty in paragraph [0073] concerns setting a threshold value to define clusters. In contrast, Applicant's invention as recited in independent claims 11 and 28, concerns the extraction of "granule features" (e.g., words) from a text object, where each granule feature is represented by a plurality of fuzzy sets and associated labels (see for example Figure 11, and description in section 2.A.1.c "Granule Fuzzy Set Feature Extraction" starting on page 13, line 9 of Applicant's specification).

Moreover, Shetty's reference to "granularity of clustering in paragraph [0073]

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fails to disclose or suggest as claimed by Applicant in independent claims 11 and 28: constructing a document granule feature fuzzy set; aggregating each degree of match of a plurality of ones of the granule features to define an overall degree of match for each feature; and using the overall degree of match to assign the text object a class label.

2.3 Summary

Accordingly, Applicant respectfully submits that independent claims 1, 11, 22, and 28 are patentably distinguishable over Shetty. Insofar as claims 2-10, 12-21, 25-27, and 29 are concerned, these claims depend from one of now presumably allowable independent claims 1, 11, 22, and 28 and are also believed to be in allowable condition.

3. Conclusion

In view of the foregoing remarks, reconsideration of this application and allowance thereof are earnestly solicited. In the event the Examiner considers a personal contact advantageous to the disposition of this case, the Examiner is hereby requested to call Attorney for Applicant(s), Thomas Zell.

Respectfully submitted,

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